CLAIMS

1. A method of electrically addressing a matrix screen of bistable nematic liquid crystals with breaking of anchoring, the method comprising the steps which consist in applying controlled electrical signals respectively to row electrodes and to column electrodes of the screen, and being characterized in that it further comprises the steps which consist in simultaneously addressing a plurality of rows using similar row signals that are offset in time by a duration greater than or equal to the time column voltages, said row addressing signals comprising in a first period at least one voltage value serving to break the anchoring of all of the pixels in the row, followed by a second period enabling the final states of the pixels making up the address row to be determined, said final states being a function of the value of each of the electrical signals applied to the corresponding columns.

2. A method of addressing a matrix screen of bistable nematic liquid crystals with breaking of anchoring according to claim 1, characterized by the fact that the screen uses two textures, one texture being uniform or lightly twisted in which the molecules are at least substantially parallel to one another, and the other texture differing from the first by a twist of the order of ±180°.

3. A method according to either preceding claim, characterized by the fact that the ends of the column signals are synchronized on the ends of the row signals.

4. A method according to any preceding claim, characterized by the fact that

$$\tau_C \leq \tau_D < \tau_L$$

in which relationship:

τ_D represents the time offset between two row signals;

τ_L represents the row addressing time comprising at least an anchoring breaking stage and a texture selection stage; and

τ_c represents the duration of a column signal.

5. A method according to any preceding claim, characterized by the fact that the time for addressing $\underline{x}$ simultaneously addressed rows is equal to

$$\tau_L + [\tau_D(x-1)]$$

in which relationship:

τ_D represents the time offset between two row signals; and

τ_L represents the row addressing time including at least an anchoring breaking stage and a texture selection stage.

6. A method according to any one of claims 1 to 5, characterized by the fact that the rows addressed simultaneously in time overlap are adjacent rows.

7. A method according to any one of claims 1 to 5, characterized by the fact that the rows addressed simultaneously in time overlap are rows that are spaced apart.

8. A method according to claim 7, characterized by the fact that it consists in simultaneously addressing i modulo j rows, i.e. rows i, i+j, i+2j, etc., by providing a row signal of duration $\tau_L = j\tau_D$, by offsetting two successive simultaneously applied row signals in time by τ_D, and by offsetting the successive blocks of simultaneously applied row signals by τ_L.

9. A method according to any one of claims 1 to 8, characterized by the fact that the parameters of the

signals applied to the screen column electrodes are adapted to reduce the rms voltage of interfering pixel pulses in order to reduce the interfering optical effects of the addressing.

10. A method according to any one of claims 1 to 9, characterized by the fact that the parameters of the signals applied to the screen column electrodes are adapted to reduce the rms voltage of the interfering pixel pulses to a value of less than the Freedericksz voltage, so as to reduce the interfering optical effects of the addressing.

11. A method according to claim 10, characterized by the fact that the parameters adapted to the electrical signal are selected from the group comprising: the waveform and/or the duration and/or the amplitude of the column signal.

12. A method according to any one of claims 1 to 11, characterized by the fact that the duration of the column signal is less than the duration of the last plateau of the row pulse.

13. A method according to any one of claims 1 to 12, characterized by the fact that the column signal presents a squarewave shape.

14. A method according to any one of claims 1 to 12, characterized by the fact that the column signal presents a ramp shape.

15. A method according to any one of claims 1 to 14, characterized by the fact that <u>x</u> consecutive rows are addressed simultaneously with a time offset τ_D from one row to the next, the column signals corresponding to each

row being sent sequentially once every τ_D, and each row signal having a total duration of not less than $\tau_L = x\tau_D$.

16. A method according to any one of claims 1 to 15, characterized by the fact that the beginning of the row signal for the $(i+x)^{th}$ row is synchronized on the end of the row signal for the i^{th} row.

17. A method according to any one of claims 1 to 16, characterized by the fact that the row signals do not present any symmetrization.

18. A method according to any one of claims 1 to 16, characterized by the fact that the signals present frame symmetrization.

19. A method according to claim 18, characterized by the fact that the polarities of the row signals are reversed from one image p to the following image p+1.

20. A method according to claim 18 or claim 19, characterized by the fact that the polarities of the row signals and the polarities of the column signals are reversed from one image p to the following image p+1.

21. A method according to any one of claims 18 to 20, characterized by the fact that the polarities of two successive row signals are reversed.

22. A method according to any one of claims 18 to 21, characterized by the fact that the polarities of two successive row signals, and also of two successive column signals are reversed.

23. A method according to any one of claims 17 to 22, characterized by the fact that the number of rows addressed simultaneously is not less than:

$$x_{opt} = \text{integer portion } [\tau_L/\tau_D]$$

in which relationship:

τ_D represents the time offset between row signals; and

τ_L represents the row addressing time comprising at least an anchoring breaking stage and a texture selection stage.

24. A method according to any one of claims 1 to 16, characterized by the fact that the signals present row symmetrization.

25. A method according to claim 24, characterized by the fact that each row signal comprises two successive adjacent sequences presenting respective opposite polarities.

26. A method according to claim 24 or claim 25, characterized by the fact that the column signal is split into two sequences whose ends are synchronized respectively on the end of the first sequence and on the end of the second sequence of the associated row signal, the polarities of the two column signal sequences being likewise reversed.

27. A method according to any one of claims 24 to 26, characterized by the fact that the end of the column signal is synchronized on the end of the second sequence of the associated row signal.

28. A method according to any one of claims 24 to 27, characterized by the fact that the polarities of two successive row signals are reversed.

29. A method according to any one of claims 24 to 28, characterized by the fact that the polarities of two

successive row signals and also of two successive column signals are reversed.

30. A method according to any one of claims 24 to 29, characterized by the fact that the number of rows addressed simultaneously is not less than:

$$x_{opt} = \text{integer portion } [2\tau_L/\tau_D]$$

in which relationship:

τ_D represents the time offset between two row signals; and

τ_L represents the row addressing time comprising at least an anchoring breaking stage and a texture selection stage.

31. A method according to any one of claims 1 to 30, characterized by the fact that the column signal is selected from the group comprising: a column signal of duration less than or equal to the duration of the last plateau of the row signal; a column signal of duration τ_c equal to τ_D; and a column signal of duration τ_c less than τ_D, where τ_D represents the time offset between two row signals, while τ_c represents the duration of a column signal.

32. A method according to any one of claims 1 to 31, characterized by the fact that the row signal is a two-plateau signal: a plateau during the anchoring breaking stage; and a plateau during the texture selection stage.

33. A method according to any one of claims 1 to 31, characterized by the fact that the row signal is a multi-plateau signal during the anchoring breaking stage.

34. A method according to any one of claims 1 to 31, characterized by the fact that the row signal is a multi-plateau signal during the texture selection stage.

35. A device for electrically addressing a matrix screen having a bistable nematic liquid crystal with breaking of anchoring, the device comprising means suitable for applying controlled electrical signals respectively to the row electrodes and to the column electrodes of the screen, and being characterized in that it further comprises the means suitable for simultaneously addressing a plurality of rows using similar row signals that are offset in time by a duration greater than or equal to the time column voltages are applied, said row addressing signals comprising in a first period at least one voltage value serving to break the anchoring of all of the pixels in the row, followed by a second period enabling the final states of the pixels making up the address row to be determined, said final states being a function of the value of each of the electrical signals applied to the corresponding columns.

36. A device for addressing a matrix screen of bistable nematic liquid crystals with breaking of anchoring according to claim 35, characterized by the fact that the screen uses two textures, one texture being uniform or lightly twisted in which the molecules are at least substantially parallel to one another, and the other texture differing from the first by a twist of the order of ±180°.

37. A device according to claim 35 or claim 36, characterized by the fact that the ends of the column signals are synchronized on the ends of the row signals.

38. A device according to any one of claims 35 to 37, characterized by the fact that

$$\tau_C \leq \tau_D < \tau_L$$

in which relationship:

τ_D represents the time offset between two row signals;

τ_L represents the row addressing time comprising at least an anchoring breaking stage and a texture selection stage; and

τ_c represents the duration of a column signal.

39. A device according to any one of claims 35 to 38, characterized by the fact that the time for addressing $\underline{x}$ simultaneously addressed rows is equal to

$$\tau_L + [\tau_D(x-1)]$$

in which relationship:

τ_D represents the time offset between two row signals; and

τ_L represents the row addressing time including at least an anchoring breaking stage and a texture selection stage.

40. A device according to any one of claims 35 to 39, characterized by the fact that the rows addressed simultaneously in time overlap are adjacent rows.

41. A device according to any one of claims 35 to 39, characterized by the fact that the rows addressed simultaneously in time overlap are rows that are spaced apart.

42. A device according to claim 41, characterized by the fact that it includes means suitable for simultaneously addressing i modulo j rows, i.e. rows i, i+j, i+2j, etc., by providing a row signal of duration $\tau_L = j\tau_D$, by offsetting two successive simultaneously applied row signals in time by τ_D, and by offsetting the successive blocks of simultaneously applied row signals by τ_L.

43. A device according to any one of claims 35 to 42, characterized by the fact that the parameters of the signals applied to the screen column electrodes are adapted to reduce the rms voltage of interfering pixel

pulses in order to reduce the interfering optical effects of the addressing.

44. A device according to any one of claims 35 to 43, characterized by the fact that the parameters of the signals applied to the screen column electrodes are adapted to reduce the rms voltage of the interfering pixel pulses to a value of less than the Freedericksz voltage, so as to reduce the interfering optical effects of the addressing.

45. A device according to claim 44, characterized by the fact that the parameters adapted to the electrical signal are selected from the group comprising: the waveform and/or the duration and/or the amplitude of the column signal.

46. A device according to any one of claims 35 to 45, characterized by the fact that the duration of the column signal is less than the duration of the last plateau of the row pulse.

47. A device according to any one of claims 35 to 46, characterized by the fact that the column signal presents a squarewave shape.

48. A device according to any one of claims 35 to 46, characterized by the fact that the column signal presents a ramp shape.

49. A device according to any one of claims 35 to 48, characterized by the fact that x consecutive rows are addressed simultaneously with a time offset τ_D from one row to the next, the column signals corresponding to each row being sent sequentially once every τ_D, and each row signal having a total duration of not less than $\tau_L = x\tau_D$.

50. A device according to any one of claims 35 to 49, characterized by the fact that the beginning of the row signal for the $(i+x)^{th}$ row is synchronized on the end of the row signal for the i^{th} row.

51. A device according to any one of claims 35 to 50, characterized by the fact that the row signals do not present any symmetrization.

52. A device according to any one of claims 35 to 50, characterized by the fact that the signals present frame symmetrization.

53. A device according to claim 52, characterized by the fact that the polarities of the row signals are reversed from one image $\underline{p}$ to the following image p+1.

54. A device according to claim 52 or claim 53, characterized by the fact that the polarities of the row signals and the polarities of the column signals are reversed from one image $\underline{p}$ to the following image p+1.

55. A device according to any one of claims 52 to 54, characterized by the fact that the polarities of two successive row signals are reversed.

56. A device according to any one of claims 52 to 55, characterized by the fact that the polarities of two successive row signals, and also of two successive column signals are reversed.

57. A device according to any one of claims 51 to 56, characterized by the fact that the number of rows addressed simultaneously is not less than:

$$x_{opt} = \text{integer portion } [\tau_L/\tau_D]$$

in which relationship:

τ_D represents the time offset between row signals; and

τ_L represents the row addressing time comprising at least an anchoring breaking stage and a texture selection stage.

58. A device according to any one of claims 35 to 50, characterized by the fact that the signals present row symmetrization.

59. A device according to claim 58, characterized by the fact that each row signal comprises two successive adjacent sequences presenting respective opposite polarities.

60. A device according to claim 58 or claim 59, characterized by the fact that the column signal is split into two sequences whose ends are synchronized respectively on the end of the first sequence and on the end of the second sequence of the associated row signal, the polarities of the two column signal sequences being likewise reversed.

61. A device according to any one of claims 58 to 60, characterized by the fact that the end of the column signal is synchronized on the end of the second sequence of the associated row signal.

62. A device according to any one of claims 58 to 61, characterized by the fact that the polarities of two successive row signals are reversed.

63. A device according to any one of claims 58 to 62, characterized by the fact that the polarities of two successive row signals and also of two successive column signals are reversed.

64. A device according to any one of claims 58 to 63, characterized by the fact that the number of rows addressed simultaneously is not less than:

$$x_{opt} = \text{integer portion } [2\tau_L/\tau_D]$$

in which relationship:

τ_D represents the time offset between two row signals; and

τ_L represents the row addressing time comprising at least an anchoring breaking stage and a texture selection stage.

65. A device according to any one of claims 35 to 64, characterized by the fact that the column signal is selected from the group comprising: a column signal of duration less than or equal to the duration of the last plateau of the row signal; a column signal of duration τ_c equal to τ_D; and a column signal of duration τ_c less than τ_D, where τ_D represents the time offset between two row signals, while τ_c represents the duration of a column signal.

66. A device according to any one of claims 35 to 65, characterized by the fact that the row signal is a two-plateau signal: a plateau during the anchoring breaking stage and a plateau during the texture selection stage.

67. A device according to any one of claims 35 to 65, characterized by the fact that the row signal is a multi-plateau signal during the anchoring breaking stage.

68. A device according to any one of claims 35 to 65, characterized by the fact that the row signal is a multi-plateau signal during the texture selection stage.